Time-Mean SSH from ECCO2 cube 84 and data

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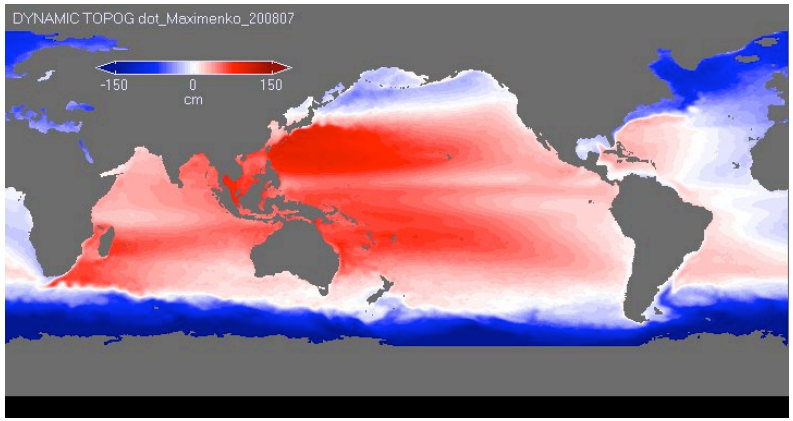
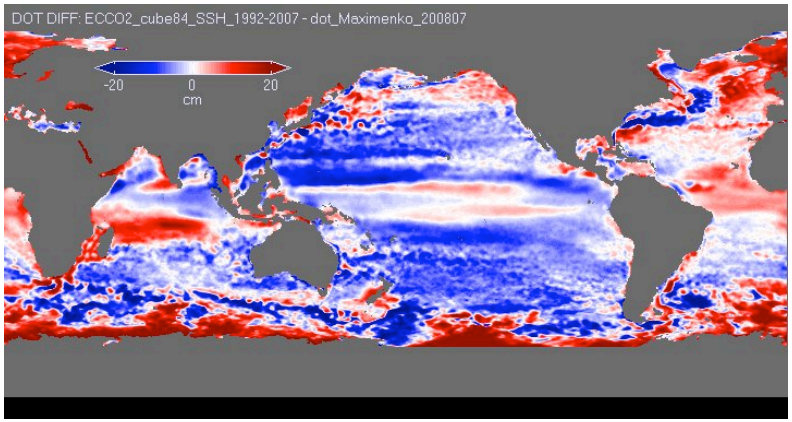
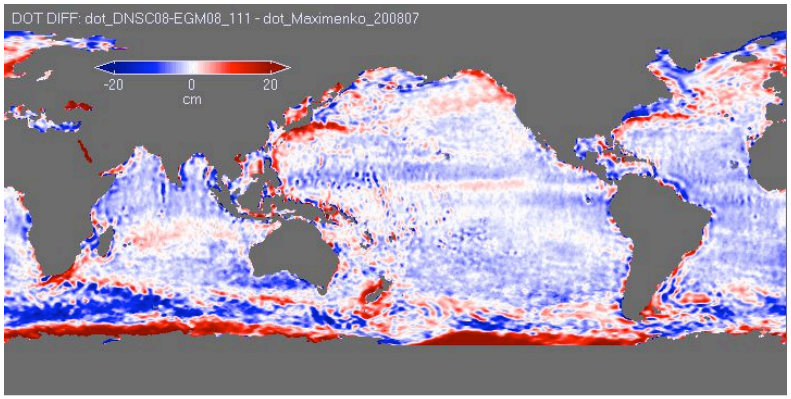
Data and Method

- DATA:
  - Sea Surface height from ECCO2 cube 84. Averaged 1992-2007. 0.5 degree ave
  - Dynamic Ocean Topography from Maximenko, Niiler and McWilliams, as updated by Maximenko as of 2008-07. Includes TOPEX+Jason+ERS altimetric MSS (from CLS), GRACE geoid, drifters, and time-varying correction to drifters from altimetric.
  - Dynamic Ocean Topography from geodetic data only: Computed by Don Chambers (U. Texas – Austin) using the MSS from Danish Space Center (Knudsen and Andersen, 2008), geoid EGM2008, an international effort that includes GRACE and other space data, in-situ gravity, and some 'magic' to use altimetric MSS for very short wavelengths, but remove ocean component by the relation between sea surface height and bathymetry (Nikos Pavlis, 2008). Averaged using a gaussian with 111km half-width.
  - Conversion of of DOT, SSH, and their difference to geostrophic vel used differences over 1 degree. (left undefined within 2 deg of the Equator for simplicity)
  - While the Maximenko and Chambers DOTs share the use of an altimetric MSS data (not the same, covers different time spans) and the use of GRACE data (not identical either), the former uses drifters, the latter uses gravity data. The difference between these two is a reaosnable measure of their accuracy.
  - For this comparison, the Maximenko surface is considered 'ground truth'

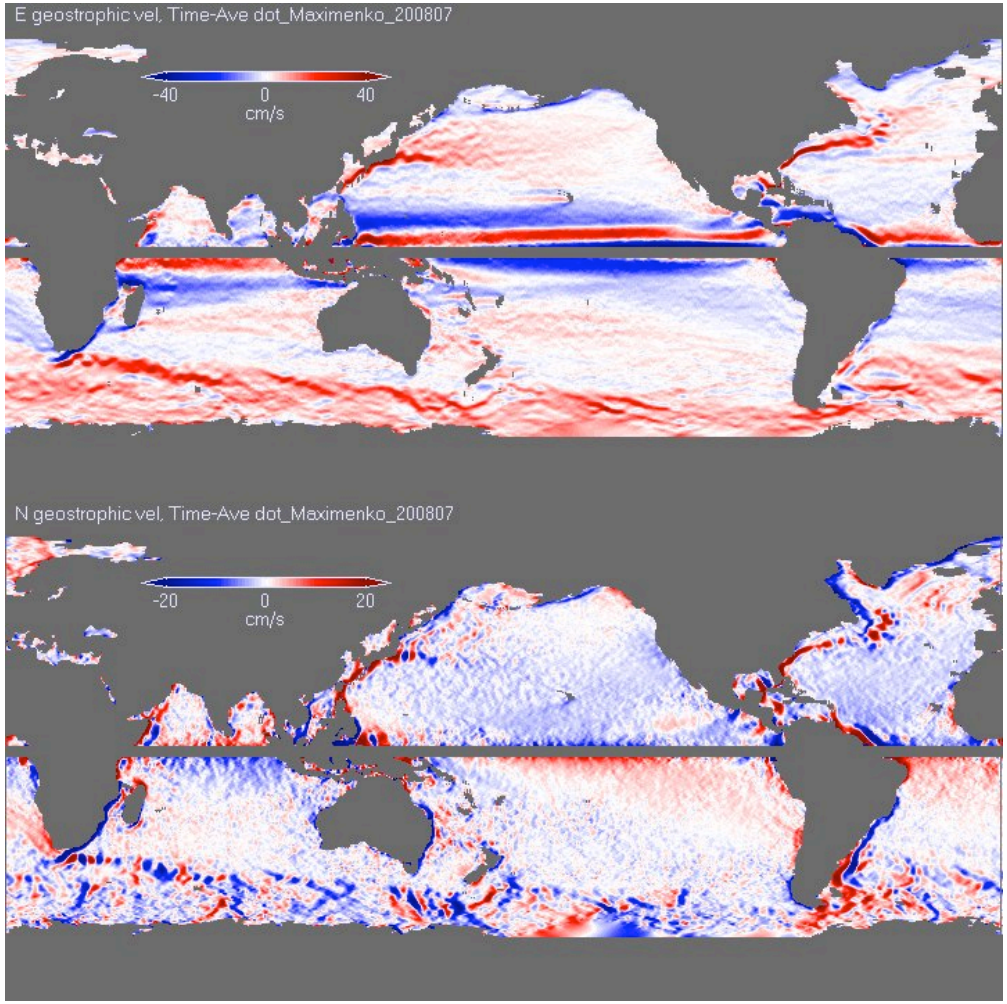
Dynamic Topography,



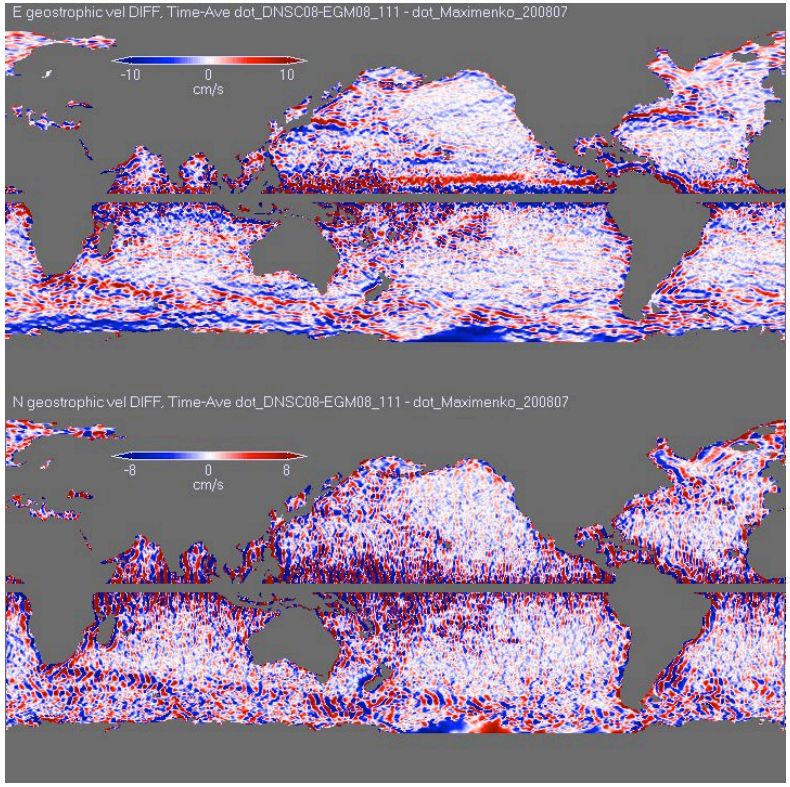


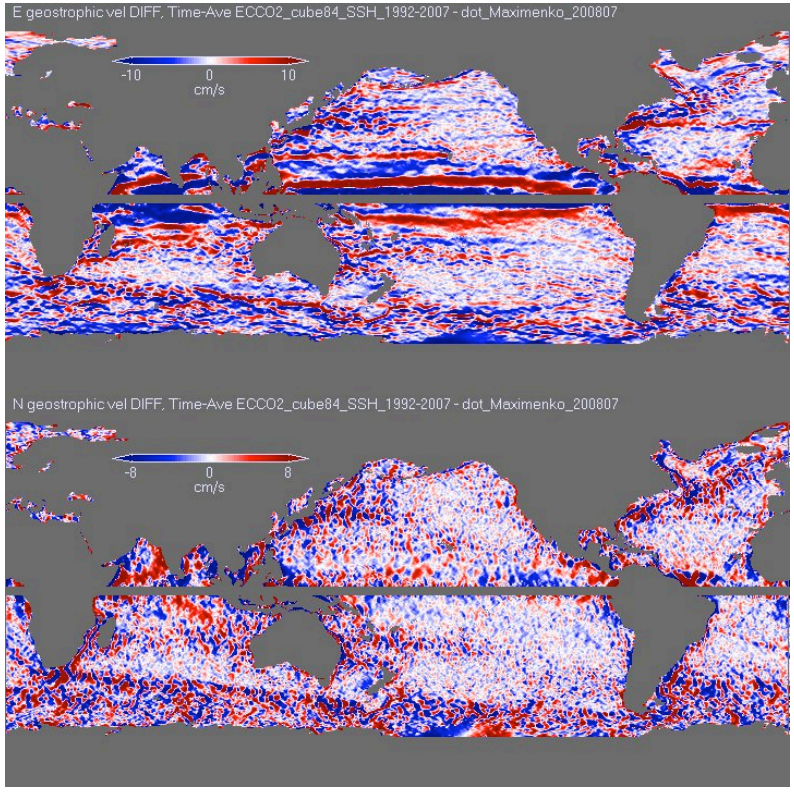


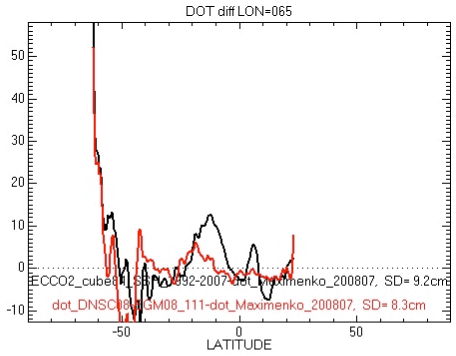
E and N geostrophic Vel from Maximenko DOT



Geostroph. Vel Diff from Maximenko.



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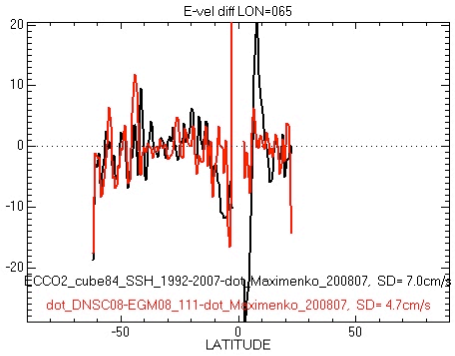
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 8.3cm
LATITUDE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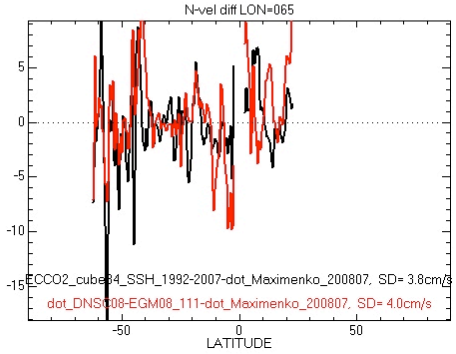
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 4.7cm/s
LATITUDE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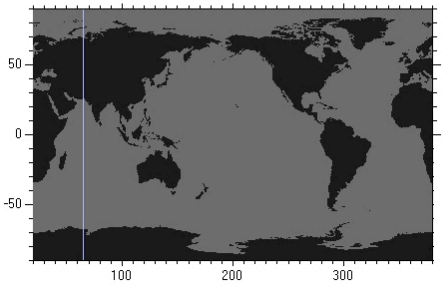
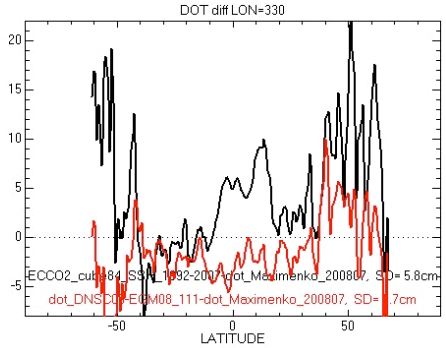
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 4.0cm/s
LATITUDE

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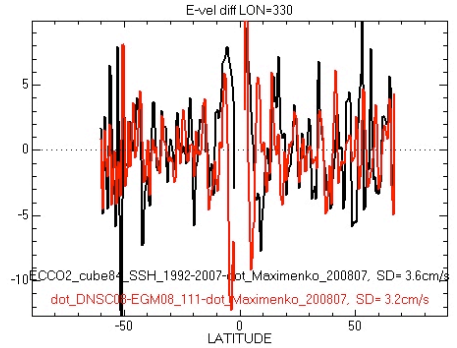
LATITUDE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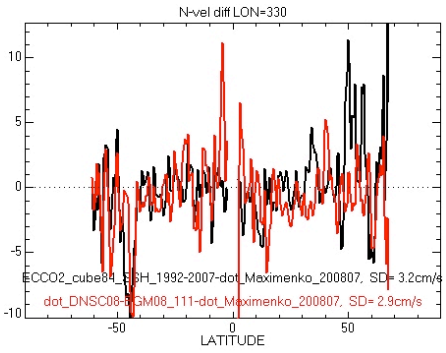
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 3.2cm/s
LATITUDE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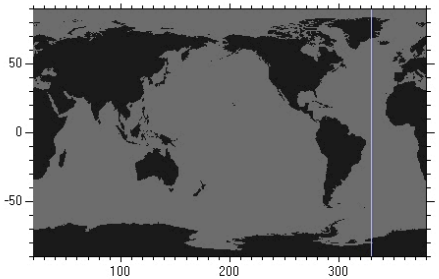
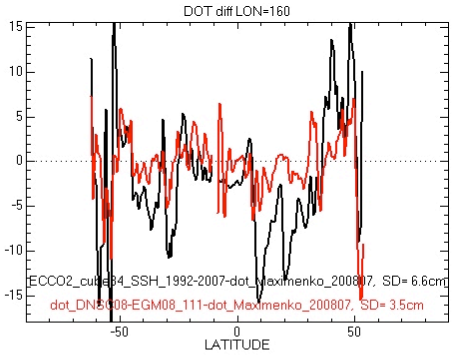
LATITUDE

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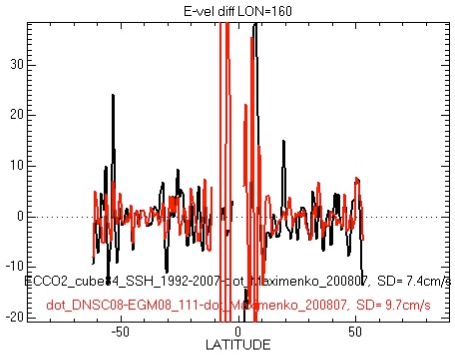
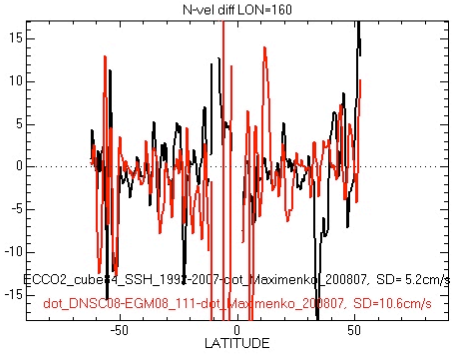
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 3.5cm
LATITUDE


E-vel diff LON=160
ECCO2_cube84_SSH_1992-2007-dot_Maximenko_200807, SD= 7.4cm/s
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 9.7cm/s
LATITUDE


N-vel diff LON=160
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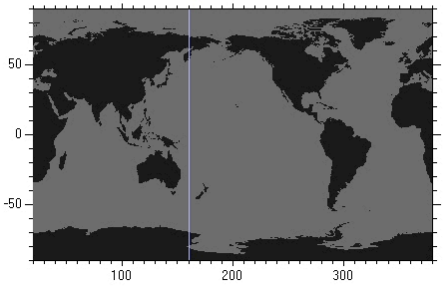
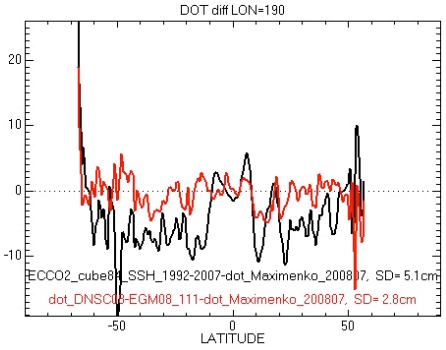
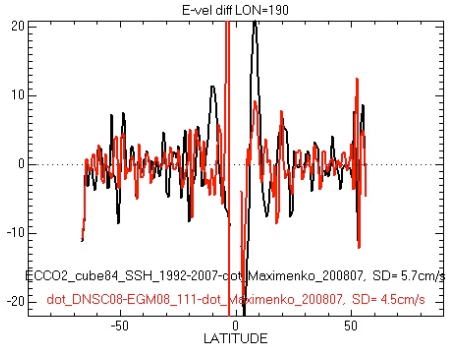
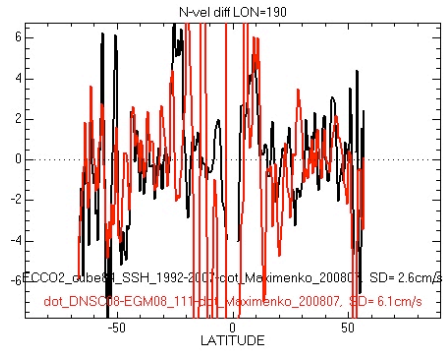
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD=10.6cm/s
LATITUDE




DOT diff LON=190
ECCO2_cube84_SSH_1992-2007-dot_Maximenko_200807, SD= 5.1cm
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 2.8cm
LATITUDE


E-vel diff LON=190
ECCO2_cube84_SSH_1992-2007-dot_Maximenko_200807, SD= 5.7cm/s
dot_DNSC08-EGM08_111-dot_Maximenko_200807, SD= 4.5cm/s
LATITUDE


N-vel diff LON=190
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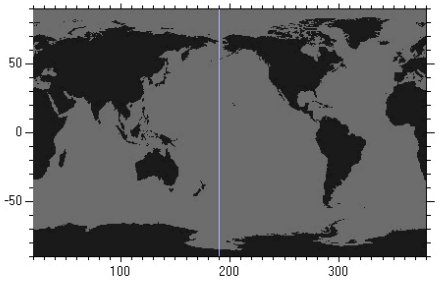
LATITUDE



Summary

- The Ecco cube 84 <SSH> differs from the Maximenko 2008 DOT significantly more that the Chambers(_DOT(Danish MSS – EGM2008) differs from the Maximenko 2008 DOT
- The difference in zonal velocities emphasizes the point above.
- Interestingly, the difference in meridional velocity is lower between ECCO-Maximenko than Chambers-Maximenko. The reason is unclear. (have not looked enough into edge effects, for example).